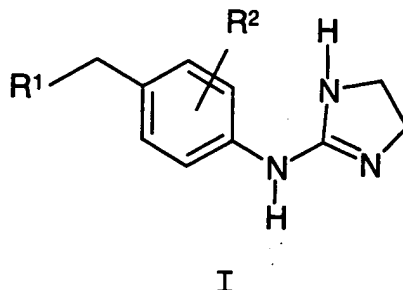


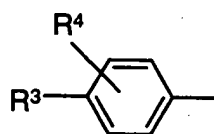
**What is claimed is:**

1. A compound selected from the group of compounds represented by Formula I:

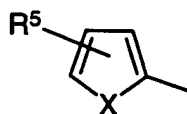


wherein:

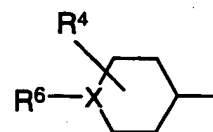
- 5  $R^1$  is a group represented by formula (A), (B) or (C):



(A)



(B)



(C)

wherein:

X is independently in each occurrence S, O or N;

- 10  $R^2$  and  $R^4$  are each independently in each occurrence:

- (1) hydrogen,
- (2) alkyloxy, or
- (3) halogen;

$R^3$  is independently in each occurrence:

- 15
- (1) alkyl,
  - (2) cycloalkyl,
  - (3) halogen,
  - (4) heterocyclyl,
  - (5)  $-NR^8R^9$ ,

- (6)  $-(CH_2)_mCONR^8R^9$ , wherein m is an integer from 0 to 3,
- (7)  $-(CH_2)_mSO_2NR^8R^9$ , wherein m is an integer from 0 to 3,
- (8)  $-(CH_2)_mNR^7COR^9$ , wherein m is an integer from 0 to 3,
- (9)  $-(CH_2)_mNR^7SO_2R^9$ , wherein m is an integer from 0 to 3,
- (10)  $-(CH_2)_mNR^7C(V)NR^8R^9$ , wherein V is S or O, and m is an integer from 0 to 3,
- (11)  $-(CH_2)_mOY$  wherein m is an integer from 0 to 3, and Y is:  
hydrogen, alkyl, alkyloxyalkyl, cycloalkyl, haloalkyl, hydroxyalkyl,  
heterocyclyl, or carboxyalkyl, or
- (12)  $-O(CH_2)_nZ$  wherein n is an integer from 1 to 4 and Z is:  
cycloalkyl, hydroxyalkyl, cycloalkyloxy, heterocyclyl, aryloxy,  
heteroaryl,  $-COR^9$ ,  $-CONR^8R^9$ ,  $-SO_2R^9$ ,  $-SO_2NR^8R^9$ , or  $-NR^7SO_2R^9$ , or  
unsubstituted aryl or mono-, di-, or tri-substituted aryl, the substituents  
being independently selected from alkyl, halogen, or alkyloxy;

$R^5$  is independently in each occurrence:

- (1)  $-(CH_2)_mOY$  wherein m is an integer from 0 to 3, and Y is:  
hydrogen, alkyl, alkyloxyalkyl, cycloalkyl, haloalkyl, hydroxyalkyl,  
heterocyclyl, or carboxyalkyl; or
- (2)  $-O(CH_2)_nZ$  wherein n is an integer from 1 to 4 and Z is:  
cycloalkyl, hydroxyalkyl, cycloalkyloxy, heterocyclyl, aryloxy,  
heteroaryl,  $-COR^9$ ,  $-CONR^8R^9$ ,  $-SO_2R^9$ ,  $-SO_2NR^8R^9$ , or  $-NR^7SO_2R^9$ , or  
unsubstituted aryl or mono-, di-, or tri-substituted aryl, the substituents  
being independently selected from alkyl, halogen, or alkyloxy;

$R^6$  is independently in each occurrence:

- (1) hydrogen,
- (2)  $-COR^9$ ,
- (3)  $-CONR^8R^9$ ,
- 5 (4)  $-C(V)NR^8R^9$  wherein V is O or S,
- (5)  $-SO_2R^9$ , or
- (6)  $-SO_2NR^8R^9$ ;

$R^7$  and  $R^8$  are each independently in each occurrence:

- (1) hydrogen,
- 10 (2) alkyl, or
- (3) hydroxyalkyl;

$R^9$  is independently in each occurrence:

- (1) alkyl,
- (2) cycloalkyl,
- 15 (3) arylalkyl,
- (4) hydroxyalkyl,
- (5) haloalkyl,
- (6) heterocyclyl,
- (7) unsubstituted aryl or mono-, di-, or tri-substituted aryl, the  
20 substituents being independently selected from alkyl, halogen, or  
alkyloxy, or
- (8) heteroaryl; or

$R^8$  and  $R^9$  are taken together with the nitrogen to which they are attached to form a 5- or  
6-membered monocyclic saturated or unsaturated ring, and in which the ring is  
25 optionally substituted or unsubstituted with oxo; or

$R^7$  and  $R^9$  are taken together with the nitrogen to which they are attached to form a 5- or 6-membered monocyclic saturated or unsaturated ring, and in which the ring is optionally substituted or unsubstituted with oxo; or a pharmaceutically acceptable salt or a crystal form thereof.

5

2. The compound of Claim 1 wherein  $R^2$  and  $R^4$  are each independently in each occurrence hydrogen or halogen.
3. The compound of Claim 2 wherein  $R^2$  and  $R^4$  are each independently hydrogen, fluoro or chloro.
- 10 4. The compound of Claim 3 where  $R^1$  is a group represented by formula (A).
5. The compound of Claim 4 wherein  $R^3$  is  $-(CH_2)_mOY$  wherein  $m$  is an integer from 0 to 3.
6. The compound of Claim 5 wherein  $Y$  is alkyl, alkyloxyalkyl, cycloalkyl or heterocyclyl.
7. The compound of Claim 6 wherein  $Y$  is methyl, isopropyl, isobutyl, *sec*-butyl, *tert*-butyl, 15 alkyloxyalkyl, cycloalkyl or heterocyclyl.
8. The compound of Claim 6 wherein  $Y$  is alkyl, 2-ethoxy-1-(ethoxymethyl)ethyl, cycloalkyl or heterocyclyl.
9. The compound of Claim 6 wherein  $Y$  is alkyl, alkyloxyalkyl, cyclopentyl, cyclohexyl or heterocyclyl.
- 20 10. The compound of Claim 6 wherein  $Y$  is alkyl, alkyloxyalkyl, cycloalkyl, tetrahydropyran-4-yl or tetrahydropyran-2-yl.
11. The compound of Claim 7 wherein  $R^2$  and  $R^4$  are hydrogen,  $Y$  is isopropyl, and  $m$  is the integer 0.
12. The compound of Claim 11 wherein the pharmaceutically acceptable salt is selected 25 from hydrochloride, sulfate or oxalate, or a crystal form thereof.

13. The compound of Claim 12 wherein the pharmaceutically acceptable salt is sulfate or a crystal form thereof.
14. The compound of Claim 13 wherein the crystal form is selected from Form I or Form II.
15. The compound of Claim 14 wherein the crystal form is Form I characterized by the following X-ray powder diffraction pattern expressed in terms of "d" spacings and relative intensities (IR):

d, 10 <sup>-10</sup> m	RI, %
31.084	100
10.266	4
7.686	39
5.546	4
5.451	3
5.118	10
4.838	10
4.767	13
4.744	13
4.391	3
4.179	9
4.149	9
3.947	7
3.898	6
3.838	4
3.697	6
3.554	3
3.408	3

16. The compound of Claim 14 wherein the crystal form is Form II characterized by the following X-ray powder diffraction pattern expressed in terms of "d" spacings and relative intensities (IR):

d, 10 <sup>-10</sup> m	RI, %
25.664	100
12.756	3
6.386	49
4.397	7
4.258	9
4.086	3
3.910	4
3.307	4

- 5 17. The compound of Claim 4 wherein R<sup>3</sup> is -O(CH<sub>2</sub>)<sub>n</sub>Z wherein n is an integer from 1 to 4.
18. The compound of Claim 17 wherein Z is cycloalkyl, heterocyclyl or hydroxyalkyl.
19. The compound of Claim 18 wherein Z is cyclopentyl, cyclohexyl, heterocyclyl or hydroxyalkyl.
20. The compound of Claim 18 wherein Z is cycloalkyl, tetrahydropyran-4-yl or  
10 tetrahydropyran-2-yl, or hydroxyalkyl.
21. The compound of Claim 18 wherein Z is cycloalkyl, heterocyclyl or 1-hydroxymethyl.
22. The compound of Claim 4 wherein R<sup>3</sup> is -(CH<sub>2</sub>)<sub>m</sub>SO<sub>2</sub>NR<sup>8</sup>R<sup>9</sup> or -(CH<sub>2</sub>)<sub>m</sub>SO<sub>2</sub>NR<sup>8</sup>R<sup>9</sup> wherein m is an integer from 0 to 3.
23. The compound of Claim 22 wherein R<sup>8</sup> is hydrogen or alkyl, and R<sup>9</sup> is alkyl or arylalkyl.
- 15 24. The compound of Claim 23 wherein R<sup>8</sup> is hydrogen, methyl, ethyl or propyl, and R<sup>9</sup> is methyl, ethyl, propyl, isopropyl, n-butyl, isobuty, *sec*-buty, *tert*-butyl or arylalkyl.
25. The compound of Claim 23 wherein R<sup>8</sup> is hydrogen, methyl, ethyl or propyl, and R<sup>9</sup> is alkyl or benzyl.

26. The compound of Claim 4 wherein  $R^3$  is  $-(CH_2)_mNR^7SO_2R^9$  or  $-(CH_2)_mNR^7COR^9$  wherein m is an integer from 0 to 3.
27. The compound of Claim 26 wherein  $R^7$  is hydrogen or alkyl, and  $R^9$  is alkyl, aryl or arylalkyl.
- 5 28. The compound of Claim 27 wherein  $R^7$  is hydrogen, methyl, ethyl or propyl, and  $R^9$  is methyl, ethyl, propyl, isopropyl, n-butyl, isobutyl, *sec*-butyl, *tert*-butyl, aryl or arylalkyl.
29. The compound of Claim 27 wherein  $R^7$  is hydrogen, methyl, ethyl or propyl, and  $R^9$  is alkyl, phenyl or arylalkyl.
30. The compound of Claim 27 wherein  $R^7$  is hydrogen, methyl, ethyl or propyl, and  $R^9$  is  
10 alkyl, aryl or benzyl
31. The compound of Claim 3 where  $R^1$  is a group represented by formula (B) wherein X is S.
32. The compound of Claim 31 wherein  $R^3$  is  $-(CH_2)_mOY$  wherein m is an integer from 0 to 3.
- 15 33. The compound of Claim 32 wherein Y is alkyl, alkyloxyalkyl, cycloalkyl or heterocyclyl.
34. The compound of Claim 33 wherein Y is methyl, isopropyl, isobutyl, *sec*-butyl, *tert*-butyl, alkyloxyalkyl, cycloalkyl or heterocyclyl.
35. The compound of Claim 33 wherein Y is alkyl, 2-ethoxy-1-(ethoxymethyl)ethyl, cycloalkyl or heterocyclyl.
- 20 36. The compound of Claim 33 wherein Y is alkyl, alkyloxyalkyl, cyclopentyl, cyclohexyl or heterocyclyl.
37. The compound of Claim 33 wherein Y is alkyl, alkyloxyalkyl, cycloalkyl, tetrahydropyran-4-yl or tetrahydropyran-2-yl.
38. The compound of Claim 31 wherein  $R^3$  is  $-O(CH_2)_nZ$  wherein n is an integer from  
25 1 to 4.

39. The compound of Claim 3 where R<sup>1</sup> is a group represented by formula (C) wherein X is N.

40. A compound of Formula I selected from:

2-[4-(4-isopropoxybenzyl)phenyl]amino-imidazoline,

5 2-[4-[4-(*sec*-butoxy)benzyl]phenyl]amino-imidazoline,

2-[4-[4-(cyclopentyloxy)benzyl]phenyl]amino-imidazoline,

2-[4-[4-(tetrahydropyran-4-yloxy)benzyl]phenyl]amino-imidazoline,

2-[4-[4-(tetrahydropyran-4-ylmethoxy)benzyl]phenyl]amino-imidazoline,

2-[4-[4-(tetrahydropyran-2-ylmethoxy)benzyl]phenyl]amino-imidazoline,

10 2-[4-[2-fluoro-4-(tetrahydropyran-4-ylmethoxy)benzyl]phenyl]amino-imidazoline,

2-[4-[4-(2-ethoxy-1-(ethoxymethyl)ethoxy)benzyl]phenyl]amino-imidazoline,

2-[4-(4-cyclopentyloxythienyl-2-ylmethyl)phenyl]amino-imidazoline,

2-[4-[4-(4-methoxyphenyl)sulfonylmethylamino-ethoxybenzyl]phenyl]amino-imidazoline,

15 2-[4-[4-(1-hydroxymethyl-ethoxy)benzyl]phenyl]amino-imidazoline,

2-[4-(5-methoxythienyl-2-ylmethyl)phenyl]amino-imidazoline,

2-[4-(4-butylaminosulfonylbenzyl)phenyl]amino-imidazoline,

2-[4-(4-isopropoxymethylbenzyl)phenyl]amino-imidazoline,

2-[4-(4-*sec*-butoxymethylbenzyl)phenyl]amino-imidazoline,

20 2-[4-[4-(isobutylaminosulfonyl)benzyl]phenyl]amino-imidazoline,

2-[4-(4-benzylaminocarbonylbenzyl)phenyl]amino-imidazoline,

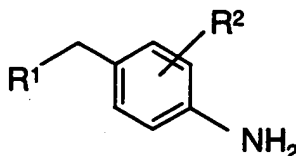
2-[4-(4-isopropylaminosulfonylbenzyl)phenyl]amino-imidazoline,

2-[4-(4-isobutylaminocarbonylbenzyl)phenyl]amino-imidazoline, or

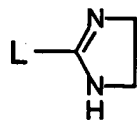
2-[4-(4-*tert*-butylaminosulfonylbenzyl)phenyl]amino-imidazoline.



41. A compound of Claims 1, 4, 31, 39 or 40 wherein the pharmaceutically acceptable salt is selected from hydrochloride, oxalate or sulfate, or a crystal form thereof.
42. A process for preparing a compound of Claim 1 comprising reacting a compound of the formula:

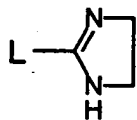


with a compound of the formula:



or an acid addition salt thereof, in which L is a leaving group.

43. The process of Claim 42 where the compound of the formula:



is an acid addition salt thereof.

44. A pharmaceutical composition suitable for administration to a mammal having a disease state that is alleviated by treatment with an IP receptor antagonist, which composition comprises as an ingredient a therapeutically effective amount of a compound of Claims 1, 4, 31, 39 or 40, or a pharmaceutically acceptable salt or a crystal form thereof, in admixture with at least one pharmaceutically acceptable non-toxic carrier.
45. A pharmaceutical composition suitable for administration to a mammal having a disease state that is alleviated by treatment with an IP receptor antagonist, which composition comprises as an ingredient a therapeutically effective amount of a

compound of Claims 15 or 16, in admixture with at least one pharmaceutically acceptable non-toxic carrier.

- 5 46. A method for treating a mammal having a disease state that is alleviated by treatment with an IP receptor antagonist, which comprises administering a therapeutically effective amount of a compound of Claims 1, 4, 31, 39 or 40, or a pharmaceutically acceptable salt or a crystal form thereof.
47. The method of Claim 46 wherein the disease state is independently selected from pain, inflammation, urinary incontinence, asthma or septic shock.
48. The method of Claim 47 wherein the disease state is pain.
- 10 49. The method of Claim 48 wherein the disease state is selected from surgical pain, visceral pain, dental pain, premenstrual pain, central pain, pain due to burns, migraine or cluster headaches, nerve injury, neuritis, neuralgias, poisoning, ischemic injury, interstitial cystitis, cancer pain, viral, parasitic or bacterial infection, post-traumatic injuries, or pain associated with functional bowel disorders.
- 15 50. The method of Claim 47 wherein the disease state is inflammation.
51. The method of Claim 50 wherein the disease state is selected from bacterial, fungal infections, viral infections, rheumatoid arthritis, osteoarthritis, surgery, bladder infection, idiopathic bladder inflammation, over-use, old age, nutritional deficiencies, prostatitis, or conjunctivitis.
- 20 52. The method of Claim 47 wherein the disease state is urinary incontinence.
53. The method of Claim 52 wherein the disease state is selected from urge incontinence, stress incontinence, or bladder hyperreactivity.
54. The method of Claim 47 wherein the disease state is asthma.
55. The method of Claim 47 wherein the disease state is septic shock.

56. A method for treating a mammal having a disease state that is alleviated by treatment with an IP receptor antagonist, which comprises administering a therapeutically effective amount of a compound of Claims 15 or 16.
57. The method of Claim 56 wherein the disease state is independently selected from pain, inflammation, urinary incontinence, asthma or septic shock.
58. The method of Claim 57 wherein the disease state is pain.
59. The method of Claim 58 wherein the disease state is selected from surgical pain, visceral pain, dental pain, premenstrual pain, central pain, pain due to burns, migraine or cluster headaches, nerve injury, neuritis, neuralgias, poisoning, ischemic injury, interstitial cystitis, cancer pain, viral, parasitic or bacterial infection, post-traumatic injuries, or pain associated with functional bowel disorders.
60. The method of Claim 57 wherein the disease state is inflammation.
61. The method of Claim 60 wherein the disease state is selected from bacterial, fungal infections, viral infections, rheumatoid arthritis, osteoarthritis, surgery, bladder infection, idiopathic bladder inflammation, over-use, old age, nutritional deficiencies, prostatitis, or conjunctivitis.
62. The method of Claim 57 wherein the disease state is urinary incontinence.
63. The method of Claim 62 wherein the disease state is selected from urge incontinence, stress incontinence, or bladder hyperreactivity.
64. The method of Claim 57 wherein the disease state is asthma.
65. The method of Claim 57 wherein the disease state is septic shock.